

Chart XIII shows the conditions of the 13th, and indicates the path of the center of this disturbance.

Fog.—There was not so much fog as during the preceding May over waters close to the British Isles and France; but from Delaware Bay to the eastern limits of the Grand Banks there was substantially as much as in May, and a decided increase was noted farther northeastward between 45° and 55° N., 20° and 35° W. This last-named region, however, had scarcely any fog close to the middle of the month or during the final week.

The region of the Grand Banks experienced little fog before the 9th, and the waters near the Maritime Provinces and New England had comparatively little during the first 8 days of the month or after the 22d.

There was somewhat less fog than usual during June over waters to southward of Nova Scotia and western Newfoundland, and generally near the 45th parallel from

the 30th meridian to the European continent. On the other hand there was more than usual near 50° N., 35° W. As a rule the waters close to the northeastern coast of the United States, and the waters southeast and east of Newfoundland had about as much fog as usual in June.

There were two well-separated 5° squares with 14 days of fog each, the greatest number tabulated from available reports. One was the square from 40° to 45° N., 65° to 70° W., the other from 40° to 45° N., 50° to 55° W.

Two considerable mishaps resulted from fog over Atlantic waters. The British Steamship *Penolver* grounded on the 12th, while approaching Louisburg, Nova Scotia. The vessel was soon freed, but had to be largely unloaded and then docked for repairs. Off Plymouth, England, two vessels collided, probably on the 22d, with much damage to each, but both vessels made port promptly.

OCEAN GALES AND STORMS, JUNE 1939

Vessel	Voyage		Position at time of lowest barometer		Gale began June	Time of lowest barometer, June	Gale ended June	Lowest barometer	Direction of wind when gale began	Direction and force of wind at time of lowest barometer	Direction of wind when gale ended	Direction and highest force of wind	Shifts of wind near time of lowest barometer
	From—	To—	Latitude	Longitude									
NORTH ATLANTIC OCEAN													
Leto, Du. S. S.	Rotterdam	Wabana	49 42 N.	39 54 W.	2	Noon, 2.	3	29.57	S	SW, 9	W	SW, 9	SW-WSW.
Aztec, Am. M. S.	Tuxpam	Houston	24 30 N.	95 40 W.	3	4a, 3.	3	29.87	SE	SE, 5	NW	NW, 8	SE-W-NW.
Chelan, U. S. Coast Guard	On ice patrol out from Halifax.		41 41 N.	53 03 W.	5	3a, 6.	5	29.81	SW	NW, 5	S	SW, 9	WNW-N.
Do.	do.		141 15 N.	52 07 W.	7	3p, 6.	8	29.84	SE	W, 3	SE	S, 8	W-SW.
Black Condor, Am. S. S.	Antwerp	New York	41 10 N.	57 52 W.	5	2a, 7.	7	29.59	SSW	SW, 6	N	SSW, 8	SW-NW.
Columbus, Ger. S. S.	Cobh	do	40 42 N.	54 12 W.	7	8a, 7.	7	29.63		SE, 8		SE, 8	
Bockenheim, Ger. S. S.	Fredrikshaven	Boston	58 39 N.	15 55 W.	8	Noon, 9.	10	29.80	SW	W, 9	W	W, 9	SW-W.
Executive, Am. S. S.	Gibraltar	New York	36 36 N.	60 15 W.	9	1a, 10.	10	29.84	SW	SW, 8	SW	SW, 8	SW-NNE.
Hibueras, Am. S. S.	New Orleans	Porto Castilla	21 48 N.	87 00 W.	12	4p, 12.	12	29.72		ENE, 6		ENE, 6	ENE-SE.
Oropesa, Br. S. S.	Havana	Cristobal	22 20 N.	84 45 W.	12	2a, 13.	13	29.49	S	S, 7	SSE	SSW, 8	S-SSW.
Carrillo, Am. S. S.	Barrios	Charleston	23 00 N.	84 12 W.	12	7a, 13.	13	29.69	E	E, 7	SSE	SE, 8	E-SE.
Alabama, Am. S. S.	Houston	San Juan	24 54 N.	85 06 W.	12	3p, 13.	14	29.77	E	SE, 8	S	SE, 9	ESE-S.
Orotava, Hond. S. S.	Tela	New Orleans	26 00 N.	88 00 W.	13	4p, 13.	13	29.67		NNE, 8		NNE, 8	
Bockenheim, Ger. S. S.	Fredrikshaven	Boston	51 31 N.	34 03 W.	13	7p, 13.	13	29.69	SSW	SW, 9	WSW	SW, 9	SSW-WSW.
Kofresi, Am. S. S.	Tampa	Mobile	29 30 66.	87 36 W.	13	6p, 14.	14	29.54	S	NE, 8	NNE	ENE, 8	ENE-N.
Gulfling, Am. S. S.	Portland, Maine.	Port Arthur	26 22 N.	86 15 W.	13	4a, 15.	15	29.75	SE	SW, 5	SW	SW, 8	None.
Frode, Dan. S. S.	Aalborg	New York	57 35 N.	20 40 W.	15	11a, 15.	15	29.41	W	WSW, 5	W	W, 8	SW-WSW.
West Madaket, Am. S. S.	Mobile	London	48 30 N.	18 00 W.	16	4a, 17.	18	29.76	W	SW, 8	NNW	SW, 8	
Tuscaloosa City, Am. S. S.	Avonmouth	Baltimore	50 48 N.	17 24 W.	16	5a, 17.	17	29.50	W	WSW, 8	W	WSW, 8	SW-WSW.
Chelan, U. S. Coast Guard.	On ice patrol out from Halifax.		41 36 N.	49 00 W.	17	1p, 17.	17	29.74	SSW	W, 7	W	SSW, 9	SSW-W.
Excello, Am. S. S.	New York	Casablanca	40 00 N.	63 24 W.	18	8p, 17.	18	29.84	NNW	NNE, 4	NNW	NNW, 8	E-NNE.
Spaarndam, Du. S. S.	Antwerp	New Orleans	36 24 N.	53 54 W.	18	7a, 18.	18	29.69		SW, 8	SW	SW, 8	W-SW-NW.
Schoharie, Am. S. S.	Bremen	Jacksonville	40 26 N.	38 13 W.	19	9a, 19.	19	29.88		S, 8		S, 8	
Frode, Dan. S. S.	Aalborg	New York	49 49 N.	39 05 W.	19	4p, 19.	19	29.48	S	SW, 8	SW	SW, 8	None.
Exiria, Am. S. S.	Gibraltar	do	40 06 N.	41 36 W.	23	2p, 23.	23	29.69	SSW	SW, 8	W	SW, 8	SSW-WSW.
NORTH PACIFIC OCEAN													
Gefion, Nor. M. S.	Yokohama	Estero Bay	43 35 N.	172 24 W.	1	4p, 1.	1	29.06	ESE	SE, 8	SE	SE, 8	ESE-SW.
Jefferson Myers, Am. S. S.	Dairen	Portland, Ore.	43 30 N.	173 00 W.	1	11p, 1.	2	29.08	E	E, 10	SE	E, 10	E-ESE.
Manoa, Am. S. S.	Mahukona	San Francisco	37 18 N.	123 24 W.	1	4a, 2.	2	29.96	N	NW, 7	NW	NNW, 8	NW-SW.
Toho Maru, Jap. M. S.	Genzan	Los Angeles	45 04 N.	179 57 E.	2	Midt, 2.	2	28.53	SW	WNW, 6	S	SW, 8	NW-SW.
Empress of Russia, Br. S. S.	Victoria, B. C.	Yokohama	50 00 N.	176 00 E.	2	4a, 3.	3	29.25	NE	NNE, 11	N	NNE, 11	NE-N.
Kaijo Maru, Jap. M. S.	San Francisco	Niigata	49 56 N.	174 00 E.	2	3a, 3.	4	29.33	NE	NNE, 8	NNW	N, 9	N-NNE-N.
Republic, U. S. A. T.	Balboa	San Francisco	15 18 N.	98 00 W.	12	5a, 13.	13	29.63	E	E, 8	E	E, 8	
Occidental, Am. S. S.	do	Los Angeles	15 00 N.	96 40 W.	13	2p, 13.	13	29.34	E	NNW, 10	W	NW, 10	E-NW.
Pres. Monroe, Am. S. S.	do	do	14 49 N.	96 55 W.	13	2p, 13.	13	29.10	S	SSE, 6	WNW	NW, 12	SSE-N-NW.
Philadelphia, U. S. N.	do	do	15 03 N.	98 34 W.	13	8a, 13.	13	29.44	E	NE, 9	WNW	N, 12	ENE-N.
Dickenson, Am. S. S.	Honolulu	Midway	27 12 N.	173 36 W.	14	6a, 14.	14	29.77		S, 9		S, 9	SSE-SW.
Niel Maersk, Dan. M. S.	Yokohama	Los Angeles	45 58 N.	174 41 W.	14	Noon, 15.	15	29.59	NNE	ENE, 3	NE	NNE, 9	NE-E.
Lewis Luckenbach, Am. S. S.	Balboa	do	17 18 N.	101 36 W.	27	5a, 28.	28	29.72	E	ESE, 7		E, 8	E-ESE.

¹ Position approximate.

NORTH PACIFIC OCEAN, JUNE 1939

By WILLIS E. HURD

Atmospheric pressure.—For the most part the average pressure distribution on the North Pacific Ocean in June 1939 was close to normal. The only radical departure noted was at Petropavlovsk, where the average of 30.01 inches was 0.15 above the normal. The Aleutian Low

was slightly deeper than in the preceding month, owing to the greater and unusual prevalence of cyclones over the central islands of the group, especially during the first and last parts of June. At Dutch Harbor the average pressure was 29.89, as compared with 29.94 in May. High pressure was central over the eastern part of the ocean in middle latitudes. The usual summer low prevailed off the China coast.

TABLE 1.—Averages, departures and extremes of atmospheric pressure at sea level, North Pacific Ocean, June 1939, at selected stations

Station	Average pressure	Departure from normal	Highest	Date	Lowest	Date
	<i>Inches</i>	<i>Inch</i>	<i>Inches</i>		<i>Inches</i>	
Point Barrow.....	30.06	+0.07	30.44	12	29.76	30
Dutch Harbor.....	29.89	— .01	30.36	12	29.00	5
St. Paul.....	29.91	+ .05	30.42	13, 14	29.24	5
Kodiak.....	29.97	+ .06	30.40	12	29.72	5, 18
Juneau.....	30.00	— .01	30.36	10	29.57	14
Tatoosh Island.....	30.07	+ .05	30.29	21	29.56	15
San Francisco.....	29.94	— .02	30.08	3	29.79	26
Mazatlan.....	29.84	+ .01	29.92	30	29.74	14
Honolulu.....	30.04	— .00	30.13	9	29.05	26
Midway Island.....	30.07	+ .02	30.21	24, 27, 28	29.65	13
Guam.....	29.86	— .01	29.94	4	29.74	28
Manila.....	29.80	+ .05	29.89	9, 14	29.68	2
Hong Kong.....	29.70	— .00	29.80	4, 5	29.61	19
Naha.....	29.79	+ .01	29.92	4	29.53	16
Titijima.....	29.86	— .05	30.03	12, 13, 30	29.50	27
Petropavlovsk.....	30.01	+ .15	30.30	15, 23	29.65	30

NOTE.—Data based on 1 daily observation only, except those for Juneau, Tatoosh Island, San Francisco, and Honolulu, which are based on 2 observations. Departures are computed from best available normals related to time of observation.

Cyclones and gales of the extratropics.—By far the most important cyclone of the month was one that left the vicinity of Kamchatka late in May and was centered south of the central Aleutians from the 1st to 3d of June, thereafter moving northward into the Bering Sea with lessened energy. This storm was unusually intense for the latitude in June, with central barometer readings close to 29 inches on the 1st and 3d, and on the 2d falling to 28.53 inches, as reported by the Japanese motorship *Toho Maru*, in 45°04' N., 179°57' E. Gales reported in connection with the storm were mostly confined to the area embraced between latitudes 40° and 50° N., longitudes 170° E. and 170° W. Local gales of forces as high as 10 were encountered in the eastern part of the storm region on the 1st, and in the western part on the 2d. The highest wind reported was of force 11, from north-northeast, barometer 29.25, experienced by the British steamship *Empress of Russia*, in 50° N., 176° E., on the morning of the 3d.

During the 13th to 15th a disturbance of locally moderate intensity lay over midocean. On the 13th Midway Island had a barometer of 29.65 inches, and early on the 14th, some 5° to the east-southeastward (in 27°12' N., 173°36' W.) the American steamer *Dickenson* encountered a south gale of force 9, barometer 29.77. The disturbance was of great extent, but the only other gales reported in connection with it were experienced by the Danish motorship *Niel Maersk*, maximum force 9, from north-northeast, during the afternoon of the 14th and early on the 15th near 46° N., between 175° W. and 180°.

From the 26th to 30th a disturbance lay over northern waters. Late on the 26th it was central near 45° N., 175° E., but on the 27th and 28th it covered the middle Aleutians, with central pressures close to 29 inches, after which it moved into the southern part of the Bering Sea. Along the northern routes south of the Aleutians, particularly on the 27th, there was some rough weather, with highest wind forces of 7 and 8 reported locally by radio.

Aside from the gales already referred to, only one other was reported from middle or higher latitudes. That was a northerly gale of force 8 experienced by the American steamer *Manoa* on the 1st, while approaching the California coast.

Tropical hurricane off west coast of Mexico, June 13.—A tropical cyclone was reported by several north-bound vessels off the Mexican west coast between the Gulf of

Tehuantepec and Acapulco on the 13th. So far as these reports indicate, the cyclone had its origin during the night of the 12th–13th and disappeared from observation before midnight of the 13th. The strongest wind experienced on board the United States Army Transport *Republic* was of force 8 from east, barometer 29.63, at 5 a. m., in 15°18' N., 98° W. On the American steamship *Occidental*, northwesterly gales of force 10 occurred between about 2 p. m. and 4 p. m., lowest barometer 29.34 at 2 p. m., in 15° N., 96°40' W.

In a special report prepared by Second Officer H. A. Shutz, of the American steamship *President Monroe*, the ship is indicated as having experienced winds of gale force from shortly after local noon until about 6 p. m., with lowest barometer, 29.10 inches, at 2:20 p. m. The ship's noon position by dead reckoning was 14°49' N., 96°55' W. The wind was then south, force 6, barometer 29.82 (corrected); there was heavy rain and a confused sea, with heavy southwest swell. At 1 p. m. the wind had increased to force 10. Now quoting from the report of Mr. Shutz:

1:30, barometer 29.35. At 2 p. m. wind decreased to south-southeast, 6, barometer 29.17; 2:20 p. m., barometer at lowest read 29.10; confused swell and cross seas. 2:30 p. m., wind hauling to north with force of 5. 3 p. m., barometer 29.20, wind north, 10. 3:15 p. m., wind blowing from northwest with full hurricane force, heavy rains, visibility nil; sharp precipitous seas from northwest; short and heavy northwest swell and increasing; wind estimated to be 100 miles per hour. 4 p. m., wind northwest, 12, barometer 29.45, wind slowly shifting to west-northwest, decreasing to force 9. 6 p. m., wind northwest-by-west, force 7.

A further special report of the hurricane was made by the Commander of Cruiser Division Eight, U. S. S. *Philadelphia*, Flagship, and furnished to the Weather Bureau through kindness of the United States Hydrographic Office. This vessel ran into a 30-knot wind from almost due east, at 5 a. m., barometer 29.62, in 14°52' N., 97°49' W. At 8 a. m. the ship had lowest barometer, 29.44, accompanied by a northeast gale of force 9, in 15°03' N., 98°34' W. At 9:30 a. m., with slowly rising barometer, the wind was highest, of hurricane force, from north-northeast, in 15°09' N., 98°57' W.

Tropical disturbance of June 27–28.—On the 27th and 28th the observations of the American steamer *Lewis Luckenbach*, Balboa to Los Angeles, gave suspicion of the formation of a small cyclone up the Mexican coast from Acapulco. The ship was in a moderate east gale at noon of the 27th. At 3 p. m. the force had risen to 8. At 5 a. m. of the 28th the wind was east-southeast 7, diminishing, lowest barometer 29.72, in 17°18' N., 101°36' W. There are, however, no further data available concerning this disturbed condition.

Fog.—Over the eastern half of the northern steamship routes fog had increased materially since the preceding month, but over the western half, where fog is usually much more frequently observed than in May, there was little change. The most frequented area in east longitude was between 40° and 45° N., 155° and 160° E., where fog was reported on 6 days. Southwestward, on the route to Yokohama, the intervening 5° squares each had 3 days with fog. In west longitudes fog was observed on 3 to 4 days over most of the area lying between 40° and 50° N., 135° and 175° W. Six days were reported with fog along the Peninsula of Alaska, and 2 off the east China coast. Along the American coast fog was noted as follows: Off Washington on 4 days; Oregon on 1 day; California on 11 days; and Lower California on 4 days.